

NASA TECH BRIEF



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Detection of Entrapped Moisture in Honeycomb Sandwich Structures

The problem:

Bonded honeycomb sandwich structures have been developed to offer structural qualities that equal prior configurations of much greater weight. However, entrapped moisture within the intercellular portions of the honeycomb has posed problems and its detection is a major concern. Many moisture detecting techniques other than weighing have been investigated.

The solution:

A thermal neutron moisture detection system that establishes the presence of entrapped moisture in intercellular areas down to a level of 0.0015 pound per cubic foot.

How it's done:

A radium/beryllium fast neutron source is used to bombard a specimen with neutrons of a known moderate source strength. Upon collision with the particles of the target nucleus, the particles of the incident nuclear radiation lose much of their kinetic energy, causing emission of thermal (slow) neutrons from the target nucleus. The emitted thermal neutrons are detected and counted by a boron trifluoride thermal neutron detector and the count is displayed by means of a scaler and rate meter. The number of

counts registered above a predetermined background with time is a function of the concentration of the target nucleus, entrapped moisture.

Notes:

1. Radiographic, isotope dilution, radionuclide activation, eddy current variation, and fluoroscopy methods were investigated but proved less sensitive and/or reliable than the technique described.
2. Inquiries concerning this invention may be directed to:

Technology Utilization Officer
Manned Spacecraft Center
Houston, Texas 77058
Reference: B67-10116

Patent status:

Inquiries about obtaining rights for the commercial use of this invention may be made to NASA, Code GP, Washington, D.C. 20546.

Source: William B. Hallmark
of North American Aviation, Inc.
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Category 01